Introduction to Herbicide Applications and Noxious Weeds

Ryan Surad, Coordinator
Noxious Weed & Pest Management
Qualified Supervisor
Turf, Right of Way, Rangeland
Bachelor of Science - Restoration Ecology

MESA COUNTY
NATURAL RESOURCES

Learning Objectives

- Colorado Noxious Weed Act
- Define noxious weeds
- Overview of pesticide labels
- Safety and protection
- Calibration
- Pesticide application
- Best management practices
- Noxious Weed identification and treatment options

What we do

- Assist private landowners with treatments and recommendations for noxious weed species.
- Treat noxious weeds in unincorporated Mesa County rights-of-ways.
- Monitor and scout for noxious weeds.
- Japanese Beetle eradication program.
- Outreach and education.

Colorado Noxious Weed Act (CRS 35-5.5) - 1990

Regulations requiring landowners to control non-native invasive plants that threaten ecosystems, agriculture, and property values.

This law specifies which non-native plants are classified as noxious weeds.

Counties and municipalities are empowered to create and enforce their own noxious weed management plans and local regulations.

Weeds are categorized by required management. The Colorado Department of Agriculture classifies noxious weeds into List A, B, and C based on the distribution and the required control efforts, ranging from mandatory eradication for rare species to suppression for widespread ones.

What is a Noxious Weed?

Noxious weeds are non-native, invasive plants that threaten and disrupt our natural and agricultural lands. Their presence affects our waterways, wildlife, and recreation.
Colorado Department of Agriculture and the Noxious Weed Advisory Committee determines if a plant should be listed.

Noxious weeds have been transported from places such as: Asia, Europe, Africa, and their natural controls, such as insects or diseases, did not arrive with them.

Noxious Weeds thrive because they are well adapted to the environment in Colorado. Some plants can produce roots 15-30 ft long, or contain chemicals harmful to humans or animals and many produce more than 10,000 seeds per year.

Pesticide Labels

The label is the LAW!

Site must be considered before deciding on a product.

Read the entire label before purchasing the product.

Consult the label: can this chemical be used in this ecosystem/site? The pesticide selected must be labeled for use in the specific site you are going to apply it.
Be sure to read Re-entry Interval (REI) and Preharvest Interval (PHI) for a crop, and other restrictions (grazing, reseeding).

Organized starting with the product's brand name, active ingredients, signal word, and child hazard warning on the front panel. Further details include precautionary statements, first aid instructions, and environmental hazard warnings. Then directions for use, followed by storage and disposal instructions.

Safety and Protection

Generally, the label states that the applicator must be wearing chemical resistant gloves, pants, shoes, socks, long sleeve shirt, and eye protection during mixing, loading, and applying.

Clean your equipment and PPE after each use with water and soap to prevent corrosion or clogs and do not use PPE or equipment outside of pesticide applications.

Wash contaminated clothes separately from other clothing with hot water, soap/detergent, and a double wash cycle.

Always depressurize the equipment before moving to a new site or storing equipment.

Backpack Sprayer Calibration

Step 1: Determine application pressure and timing

Mark off an 18.5 ft x 18.5 ft area (1/128 acre).

Fill spray tank half-full with clean water.

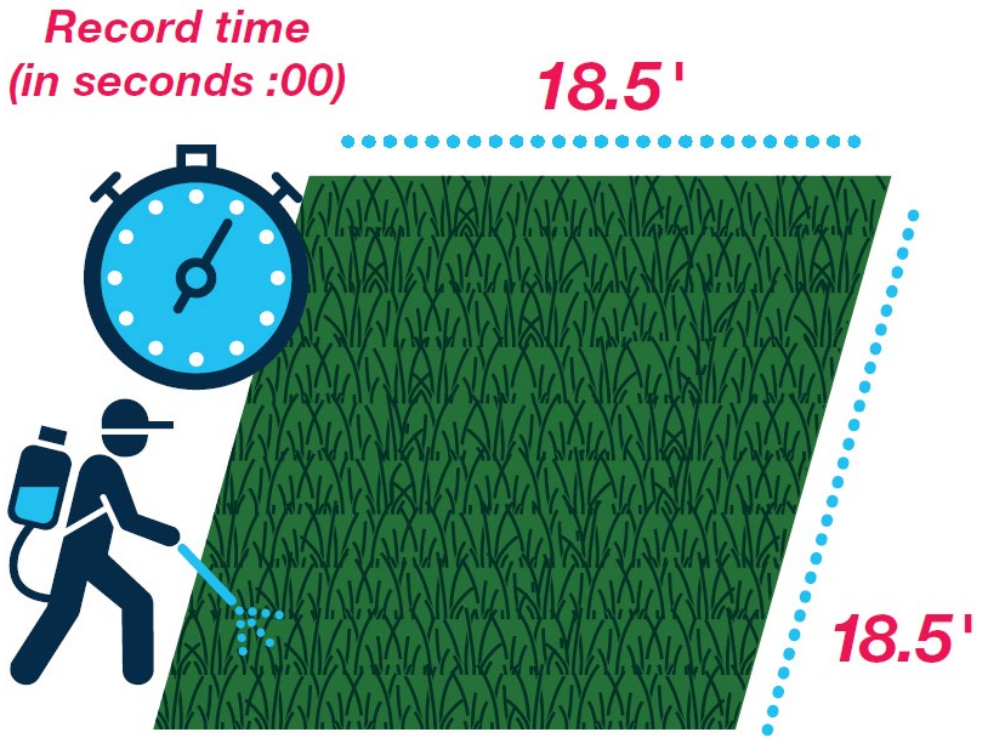
Pump to normal operating pressure.

Walk at a steady speed and maintain consistent pressure.

Spray entire area uniformly.

Record time in seconds to spray the area.

Repeat this process 2-3 times to get an average.



Backpack Sprayer Calibration

<u>Step 2:</u> Measure nozzle output

Refill tank with water and operate sprayer at the desired pressure

Use a time and fl. oz. measuring cup (128 fl. Oz. = 1 gallon)

Record the fl. oz. collected

Repeat process 2-3 times to get an average

Since there are 128 fl. oz. in 1 gallon and 18.5 ft x 18.5 ft equals 1/128 acre, then fl. oz. collected equals gallons of solution per acre.

Example: Label for Chemical A states it is to be mixed at 20 oz/acre. Therefore, if you have a 3 gallon backpack calibrated to 40 gallons/acre you would mix 1.5 oz per 3 gallon backpack.
3 gal / 40 gal/ac = .075 acres x 20 oz/acre = 1.5 oz per 3 gallons

Pesticide Application

Be sure to view the weather forecast before considering treatments.

- **It is illegal to apply pesticides in wind speeds above 10 mph.**
- **Do not apply pesticides during temperature inversions.**

Labels have a 'rainfast' that explains the timeframe after application when the pesticide has effectively dried or been absorbed by the target plant making it more resistant to being washed off by rain.

When applying herbicides make sure to cover the entire plant with the mixture. If the solution is dripping from the plant you have over-applied.

Be sure to use a **surfactant and blue dye** when applying herbicides. Surfactant assists with delivery of herbicide through cuticle (waxy layer on leaves). Blue dye helps visualize where you have treated.

Best Management Practices

Know your pests and their life cycles!

Develop a plan of action - What pests do I have? What time of year do I treat? How should I control them?

Know what **growth stage** to apply control strategies

Detect infestations early

Use clean materials: forage, seed, mulch, virus free nursery stock

Reseed with competitive species

Consult with experts

Know what pesticide to use and how to use if **safely and effectively**

Monitor your activities/treatments and **be persistent**

Change your approach if necessary (adaptive management)

TAMARISK OR SALTCEDAR (*TAMARIX RAMOSISSIMA*)

Perennial with white to pink flowers in clusters called racimes, leaves are small and scaly.

Can produce up to 600,000 seeds that are viable up to 45 days. Can reproduce vegetatively.

Increases salinity of surface soil rendering the soil inhospitable to native plant.

Photo credit: Steve Dewey, Utah State University, Bugwood.org

Photo credit: Steve Dewey, Utah State University, Bugwood.org

Russian olive (*Elaeagnus angustifolia*)

Perennial with olive-shaped fruits, silvery white leaves, alternate and narrow. Branches have 1-3 inch thorns. Yellow flowers have 4 small sepals.

Roots can fix nitrogen allowing them to germinate on bare, mineral substrates and dominate riparian vegetation.

Photo credit: Chris Evans, University of Illinois, Bugwood.org

Birds readily spread seeds and can remain viable for up to 3 years.
Ecologists have found that bird species richness is higher in riparian areas dominated by native vegetation.

Photo credit: Paul Wray, Iowa State University, Bugwood.org

Photo credit: Jan Samanek, Phytosanitary Administration, Bugwood.org

Treatment of Tamarisk or Russian Olive

Cut-stump treatments are effective; however, it can readily resprout through suckers. Apply concentrate directly to the cambium as soon as possible after cutting. Be sure to treat suckers with foliar treatments. Can be treated anytime except when temperatures go below freezing. Best treatment timing is Spring or Fall.

Cut frill techniques are also effective but many cuts need to be made to effectively deliver the herbicide.

When treating both of these species it is important to follow up with **cultural methodologies** like seeding with native species of grasses, willow stakes, and Cottonwood cuttings to reduce the chances of establishment.

Herbicide recommendations: Triclopyr (Garlon 4 Ultra or 3a), Glyphosate, Imazapyr (not approved for applications near water).

Russian knapweed (*Rhaponticum repens*)

Creeping perennial mostly reproduces from vegetative root buds.

Produces pink, lavender flowers, smooth paper bracts that lack spines, lobed leaves near rosette upper leaves have smooth margins, leaves have sandpapery texture.

Toxic to horses and allelopathic.

Emerges early spring, bolts in May and June and flowers throughout the summer.

<u>Best to treat in fall (August-October) when root buds are forming or early spring (April-June) when bolting.</u>

Diffuse knapweed (*Centaurea diffusa*) and Spotted knapweed (*Centaurea stoebe*)

Diffuse and Spotted are simple perennials that develop tap roots. Primarily reproduce through seeds.

Resembles Russian knapweed flowers. However, Spotted knapweed bracts have black tips. Diffuse bracts are sharp and produce white flowers.

Germinates in the spring or fall.

Best to treat in late summer and early fall (July-September).

Diffuse knapweed rosette- Photo credit: K. George Beck and James Sebastian, Colorado State University, Bugwood.org

Photo credit: Steve Dewey, Utah State University, Bugwood.org

Spotted knapweed rosette Linda Wilson, University of Idaho, Bugwood.org

Treatment Recommendations for Knapweed

Combining control strategies is considered most effective (mechanical [Diffuse and Spotted knapweed], cultural, biological, chemical).

Biocontrol options available at Palisade Insectary. Make sure to get on their list early!

Mechanical can be effective on Diffuse and Spotted knapweed. Requires multiple treatments each year.

Herbicide recommendations: Milestone, Clopyralid (Transline), Curtail, Perspective, and Telar.

THISTLES

Bull thistle (*Cirisum vulgare*)

Bull thistle is a biennial forb, with flower shaped like a jawbreaker, base of leaves clasp the steam and extend down the stem to a node below, leaves alternate.

Easily establishes in disturbed areas.

Best to treat in rosette and bolting stage of lifecycle.

Late applications can cause the plant to produce seeds quicker and seed out before herbicide can take effect.

Chopping flowers is somewhat effective but severed flowers can continue to mature seeds.

Mechanical, biological, and chemical treatments are all effective.

Bull Thistle
Photo credit: Ohio State Weed Lab, The Ohio State University, Bugwood.org

Bull Thistle
Photo credit: Bruce Ackley, The Ohio State University, Bugwood.org

THISTLES

Musk thistle (*Carduus nutans*)

Musk thistle is a biennial forb, 'nodding' flower head, leaf with white midrib and leaf margins with spines, wide lance-shaped bracts with spiny tips.

Easily establishes in disturbed areas.

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Musk Thistle
Photo credit: Bruce Ackley, The Ohio State University, Bugwood.org

Musk Thistle
Photo credit: Steve Dewey, Utah State University, Bugwood.org

THISTLES

Canadian thistle (*Cirsium arvense*)

Creeping perennial, cluster of 1-5 white to purple flowers, floral bracts are spineless, spiny oblong leaves, dioecious (male or female plants).

Extensive root system allows it to recover after multiple control attempts.

Can infest many types of ecosystems.

Bio-pesticide rust fungus (*Puccinia puctiformis*) has show significant impacts on population. However, USDA is debating about re-classifying this as a bio-pesticide. Therefore, it is not available until the reclassification has completed.

<u>Herbicide recommendations: Milestone, Telar (residual soil activity), Clopyralid (Transline) , 2,4-D, Glyphosate.</u>

Canadian Thistle
Photo credit: Steve Dewey, Utah State University Extension

Noxious thistle comparison
Photo credit: Steve Dewey, Utah State University Extension

HOUNDSTONGUE (*CYNOGLOSSUM OFFICIANALE*)

Biennial forb, with 5 petaled reddish-purple flowers, dense flower clusters that produce velcro like seeds with 4 capsules.

Leaves are lance or oblong with smooth edge with fine hairs.

Toxic alkaloids stop liver cells from reproducing, wildlife and livestock may live up to 6 months after ingesting a lethal dose.

Mechanical, biological and chemical treatments are all effective.

Rosette stage is when it is most susceptible to treatment (spring or fall).

Herbicide recommendations: Escort XP, Telar XP, Cimmarron X-tra, Milestone, Glyphosate, 2,4-D

Houndstongue
Photo credits: Steve Dewey, Utah State University, Bugwood.org

HOARY CRESS (*LEPIDIUM DRABA*)

Creeping perennial with gray-green lance shaped leaves. Upper leaves clasp the stem

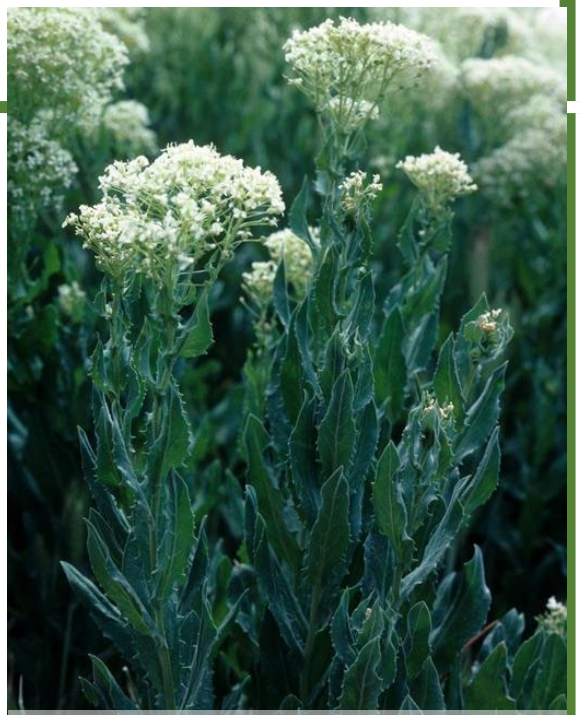
Numerous small, white flowers with 4 petals .

Plants emerge in early spring with stems emerging from the rosette in late April.

Seed capsules are heart shaped.

<u>Treating during the rosette stage is the most effective.</u>

<u>Herbicide recommendations: Telar, Escort XP, Imazapic, Milestone, 2,4-D.</u>



Hoary Cress
Photo credit: Mark Schwarzlander, University of Idaho, Bugwood.org

Hoary Cress rosette
Photo credit: K. George Beck and James Sebastian, Colorado State University, Bugwood.org

Join a Weed or Pest Volunteer Board

Noxious Weed Advisory Board

- Be a guardian of Mesa County's natural beauty.
- Play a critical role in identifying and controlling noxious weeds.
- Influence the County's environmental strategies and actions.
- Protect our ecosystem for future Mesa County generations.

Upper Grand Valley Pest Control District

- Protect commercial growers from insect, disease, and weed infestations.
- Educate the public on how to protect their community's agriculture.

Your expertise is needed on the front lines of environmental protection. Help us preserve our native vegetation and agricultural heritage as a member of the Noxious Weed Advisory Board or Upper Grand Valley Pest Control District.

MESACOUNTY.US
970-244-1885
MCADMIN@MESACOUNTY.US

Apply Now!

Thank you!

To view the Mesa County Noxious Weed Plan and our listed species visit our website under Resources for Noxious Weed Management

MESA COUNTY

Noxious Weed & Pest Management

Ryan Surad

Coordinator

Ryan.Surad@mesacounty.us

970-255-7121

Pesticide Classification

Systemic pesticides translocates the pesticide throughout the pest. Ex. Glyphosate, Triclopyr, 2,4-D, Dicamba

Non-systemic damages tissue that it lands on (contact pesticides). Ex. Diquat, vinegar

Pre-emergence herbicides are applied to the soil before weeds emerge and impact the germination of seed roots (does not harm the seed). Ex. Prodiamine, Pendimethalin, Rejuvra

Post-emergence herbicides work on plants already growing. Ex. Triclopyr, Dicamba, Glyphosate, Milestone

Pesticide Classification

Residual herbicides remain active for long periods of time 3-6 months (use extreme caution when selecting and applying bareground herbicides).
Ex. Plainsview, Method 240, Imazapyr

Short lived herbicides degrade rapidly in water, sunlight, or microorganisms.

Formulations vary from liquid solutions, ready to use solutions, emulsifiable concentrate, wettable powders, granules, and microencapsulated pesticides.

Non selective herbicides (Glyphosate, Imazapyr) control many species while **selective pesticides** (2-4, D) only work on certain species.

General Botany - Life Cycle

Annual

- Winter annuals germinate in the winter/fall and over winter. In the Spring or early Summer the plant will produce seeds and die. Ex. Cheatgrass (*Bromus tectorum*)

Cheatgrass
Photo credit: Cornell College of Agriculture

- Summer annuals germinate, grow, flower, and *die within a single growing season*. Ex. Puncturevine (*Tribulus terrestris* or goatheads)

Puncturevine
Photo credit: Washington State Noxious Weed Control Board

General Botany - Life Cycle

Biennial

- Complete their life cycle over two growing seasons.
  Ex. Houndstounge, Musk thistle, Mullien

Perennials

- Simple perennials spread by seed and emerge from existing plant year after year. Ex. Tamarisk, Tree of heaven, Siberian elm
- Creeping perennials spread by seed and underground root systems, rhizomes, or stolons. Ex. Canada thistle, Russian knapweed

Houndstounge
Photo credit: Montana State University

Houndstounge
Photo credit: Montana State University